THE CLAIMS

What is claimed is:

1. A tool for disuniting two wafers, with at least one of the wafers being used in fabricating substrates for microelectronics, optoelectronics, or optics, the tool comprising two gripper members for temporarily affixing to respective opposite faces of the wafers that are united to each other, and a disuniting control device suitable for moving the members relative to each other, wherein the disuniting control device comprises an actuator device for positively displacing the gripper members sufficiently for inducing controlled flexing in at least one of the members to assist in disuniting the wafers.

2. The tool according to claim 1, wherein one or each gripper member comprises a diaphragm having a plurality of orifices communicating on one side with a respective wafer face and on the other side with a vacuum source.

3. The tool according to claim 2, wherein the orifices are micropores.

4. The tool according to claim 1, wherein one or each gripper member comprises an electrode which has a different potential compared to that of a respective wafer face so as to provide temporary affixing by electrostatic forces.

5. The tool according to claim 4, wherein each gripper member that includes an electrode further comprises dielectric material which surrounds the electrode.

6. The tool according to claim 1, wherein the actuator device includes at least two actuators for acting on at least one gripper member at at least two distinct locations.

7. The tool according to claim 1, wherein at least one gripper member comprises a body generally in the form of a plate having different degrees of elastic deformability in at least two locations.

8. The tool according to claim 7, wherein the body is formed by assembling at least two laminations of different dimensions.

9. The tool according to claim 7, wherein the body is formed by a plate of non-uniform thickness.

10. The tool according to claim 9, wherein the thickness of the plate varies progressively.

11. The tool according to claim 9, wherein at least one groove is formed locally in the plate.

12. The tool according to claim 11, wherein the at least one groove extends entirely across the plate.

13. The tool according to claim 11, wherein the plate possesses at least two grooves.

14. The tool according to claim 13, wherein the grooves are parallel.

15. The tool according to claim 1, wherein at least one gripper member includes a member for limiting flexing.

16. The tool according to claim 15, wherein the member for limiting flexing is adjustable.

17. The tool according to claim 11, wherein the at least one gripper member in which flexing can be induced includes a member for limiting flexing provided adjacent the groove.

18. The tool according to claim 17, wherein the member for limiting flexing comprises a micrometer screw operating between regions of the plate that are situated on either side of the groove.

19. The tool according to claim 1, wherein the two gripper members are mounted to pivot relative to each other, and wherein the actuator device acts at a distance from the pivot region.

20. The tool according to claim 19, including a device for adjusting the spacing between the gripper members so as to enable united wafers of different total thicknesses to be disunited.

21. The tool according to claim 1, wherein the actuator device comprises one or more hydraulic actuators.

22. The tool according to claim 1, further comprising a device for measuring forces exerted by at least one of the actuators or spacing between the wafers.

23. An assembly for disuniting a plurality of pairs of united wafers in series, the assembly comprising a plurality of tools according to claim 1, and a common actuator device engager for jointly displacing at least one gripper member of each tool.

24. A method of disuniting two wafers, with at least one of the wafers being used in fabricating substrates for microelectronics, optoelectronics, or optics, the method comprising the following steps:

temporarily affixing two gripper members to respective opposite faces of the wafers; and

sufficiently displacing one of the gripper members relative to the other for inducing controlled flexing in at least one of the members to assist in disuniting the wafers.

25. The method according to claim 24, wherein the temporary affixing step comprises contacting the gripper members with the wafer faces by applying a vacuum.

26. The method according to claim 24, wherein the temporary affixing step comprises providing the gripper members with the wafer faces by applying electrostatic forces.

27. The method according to claim 24, wherein the displacement step comprises independently displacing two distinct regions of a single gripper member.

28. The method according to claim 24, wherein the two gripper members are mounted to pivot relative to each other, and the displacement step comprises mutually displacing regions of the gripper members that are situated at a distance from the pivot region.

29. A method of measuring the bonding energy between two wafers, with at least one of the wafers being used in fabricating substrates for microelectronics, optoelectronics, or optics, the method comprising the following steps:

temporarily affixing two gripper members to opposite faces of the wafers;

displacing one of the gripper members relative to the other sufficiently for inducing controlled flexing in at least one of the aid members in order to disunite the wafers one from the other; and

measuring the force exerted during the displacement step or measuring the separation of the wafers while performing the disuniting operation.

30. The method of claim 29 wherein both the force exerted during the displacement step and the separation of the wafers is measured while performing the disuniting operation.